1. Choose the interval below that f composed with g at $x = -1$ is in.

$$f(x) = 3x^3 + 3x^2 - 2x \text{ and } g(x) = -2x^3 - 3x^2 - 2x - 3$$

A. $(f \circ g)(-1) \in [-35.4, -34.9]$

B. $(f \circ g)(-1) \in [-11.2, -7.5]$

C. $(f \circ g)(-1) \in [-4.3, 0.9]$

D. $(f \circ g)(-1) \in [-33.6, -28.9]$

E. It is not possible to compose the two functions.

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2. Determine whether the function below is 1-1.

$$f(x) = (5x - 18)^3$$

A. Yes, the function is 1-1.

B. No, because there is a y-value that goes to 2 different x-values.

C. No, because the domain of the function is not $(-\infty, \infty)$.

D. No, because the range of the function is not $(-\infty, \infty)$.

E. No, because there is an x-value that goes to 2 different y-values.

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3. Multiply the following functions, then choose the domain of the resulting function from the list below.

$$f(x) = 5x^4 + 9x^3 + 3x^2 + 4x + 8 \text{ and } g(x) = 2x + 2$$

A. The domain is all Real numbers except $x = a$, where $a \in [-9.2, -1.2]$

B. The domain is all Real numbers less than or equal to $x = a$, where $a \in [1.5, 7.5]$

C. The domain is all Real numbers greater than or equal to $x = a$, where $a \in [-11.33, 0.67]$

D. The domain is all Real numbers except $x = a$ and $x = b$, where $a \in [3.25, 6.25]$ and $b \in [-10.2, -3.2]$

E. The domain is all Real numbers.

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4. Find the inverse of the function below. Then, evaluate the inverse at $x = 7$ and choose the interval that $f^-1(7)$ belongs to.

$$f(x) = \ln(x - 3) + 5$$

A. $f^{-1}(7) \in [8.39, 11.39]$

B. $f^{-1}(7) \in [162757.79, 162759.79]$

C. $f^{-1}(7) \in [22027.47, 22034.47]$

D. $f^{-1}(7) \in [56.6, 63.6]$

E. $f^{-1}(7) \in [-0.61, 5.39]$

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5. Find the inverse of the function below (if it exists). Then, evaluate the inverse at $x = -11$ and choose the interval that $f^-1(-11)$ belongs to.

$$f(x) = 3x^2 - 4$$

A. $f^{-1}(-11) \in [1.94, 2.92]$

B. $f^{-1}(-11) \in [7.43, 7.82]$

C. $f^{-1}(-11) \in [1.19, 1.93]$

D. $f^{-1}(-11) \in [4.35, 5.19]$

E. The function is not invertible for all Real numbers.

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6. Choose the interval below that f composed with g at $x = 1$ is in.

$$f(x) = -x^3 - 2x^2 + 2x + 3 \text{ and } g(x) = -4x^3 - 1x^2 + 2x + 2$$

A. $(f \circ g)(1) \in [0, 6]$

B. $(f \circ g)(1) \in [-30, -25]$

C. $(f \circ g)(1) \in [-5, -2]$

D. $(f \circ g)(1) \in [-25, -22]$

E. It is not possible to compose the two functions.

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7. Multiply the following functions, then choose the domain of the resulting function from the list below.

$$f(x) = 4x^4 + 2x^3 + 2x + 9 \text{ and } g(x) = 4x + 3$$

A. The domain is all Real numbers greater than or equal to $x = a,$ where $a \in [-7, 1]$

B. The domain is all Real numbers except $x = a,$ where $a \in [-4.4, 0.6]$

C. The domain is all Real numbers less than or equal to $x = a,$ where $a \in [1.67, 3.67]$

D. The domain is all Real numbers except $x = a$ and $x = b,$ where $a \in [7.2, 15.2]$ and $b \in [-7.6, -1.6]$

E. The domain is all Real numbers.

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8. Find the inverse of the function below. Then, evaluate the inverse at $x = 7$ and choose the interval that $f^-1(7)$ belongs to.

$$f(x) = e^{x-2} - 3$$

A. $f^{-1}(7) \in [-0.52, 1.86]$

B. $f^{-1}(7) \in [-1.47, -0.87]$

C. $f^{-1}(7) \in [3.95, 4.49]$

D. $f^{-1}(7) \in [-1, -0.76]$

E. $f^{-1}(7) \in [-2.16, -1.55]$

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9. Determine whether the function below is 1-1.

$$f(x) = 16x^2 + 128x + 256$$

A. No, because there is a y-value that goes to 2 different x-values.

B. No, because the range of the function is not $(-\infty, \infty)$.

C. No, because the domain of the function is not $(-\infty, \infty)$.

D. No, because there is an x-value that goes to 2 different y-values.

E. Yes, the function is 1-1.

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10. Find the inverse of the function below (if it exists). Then, evaluate the inverse at $x = -15$ and choose the interval that $f^-1(-15)$ belongs to.

$$f(x) = \sqrt[3]{2x - 3}$$

A. $f^{-1}(-15) \in [1684, 1688.7]$

B. $f^{-1}(-15) \in [1686.8, 1691.3]$

C. $f^{-1}(-15) \in [-1691.2, -1687.3]$

D. $f^{-1}(-15) \in [-1687.2, -1683.8]$

E. The function is not invertible for all Real numbers.
